

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

09/658550

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

**CERTIFIED COPY OF
PRIORITY DOCUMENT**

Signed

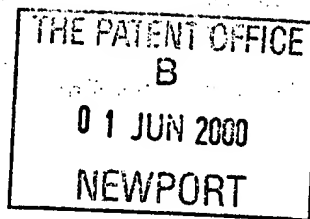
Dated 5 September 2000



1/77

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)



The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

01 JUN 2000

N00/0423/G B1JUN00 E541307-3 D00107
P01/7700 0.00 0013203.5

2. Patent application number

(The Patent Office will fill in this part)

0013203.5

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Reflective Technology Industries
Limited
Road One, Winsford Industrial Estate
Winsford
Cheshire CW7 3QQ

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

Great Britain

6449227003

4. Title of the invention

Chroma-keying

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

McNeight & Lawrence
Regent House
Heaton Lane
Stockport
Cheshire SK4 1BS

Patents ADP number (if you know it)

0001115001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

Yes

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description

3

Claim(s)

-

Abstract

-

Drawing(s)

-

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature

Date 31.05.00

McNeight & Lawrence

12. Name and daytime telephone number of person to contact in the United Kingdom

David L McNeight 0161 480 6394

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

Chroma-keying

This invention relates to chroma-keying, by which is meant the technique, used in film-making and video imaging, of superimposing a foreground image shot by a camera on to a background which has been previously recorded or which is generated by a computer.

Until recently, chroma-keying involved the use of a coloured backdrop, the electronics behind the system using the backdrop colour as a key (hence the name) to define the area of an imposed image from another filming or from a computer-generated background image. In GB 2321814 and GB 2321565 is disclosed a technique for chroma-keying in which a backdrop is retroreflective, by virtue of comprising microbeads having a hemispherical metal coating, illuminated by a source of coloured light close to the camera axis. The light is reflected straight back to the camera by the microbeads, and a very low intensity of light is required, e.g. from a ring of light emitting diodes surrounding the camera lens, which light has negligible effect on the foreground image. This is in contrast to conventional chroma-keying, which requires a high intensity of illumination to provide a sufficient signal from the backdrop to activate the electronic system. Such high intensity illumination is desirably avoided, since it makes a television studio hot to work in and even gives rise to a fire hazard, quite aside from the power cost involved. Moreover, it meant that chroma-keying could really only be carried out in the context of a professional studio.

The technique disclosed in the patent applications aforementioned, however, places substantial demands on the nature of the backdrop. Conventional retroreflective coatings for e.g. flexible backdrop fabrics are inadequate because of relatively fast fall off of

retroreflectivity with angle of incidence, and a special backdrop had to be devised in which surface roughness played an important role in levelling out, at least to some extent, the retroreflectivity over wider ranges of angle of incidence.

While this new technique dispenses with the need for very high levels of studio lighting, it relies on the presence of a light source close to the camera, usually provided in the form of a ring of bright light emitting diodes, and this can be expensive and inconvenient.

The present invention provides a method for chroma-keying and a backdrop material therefor which do not suffer these disadvantages.

The invention comprises a method for chroma-keying comprising deploying a backdrop of coloured material with retroreflective elements and imaging with a camera a scene against a backdrop with the backdrop principally illuminated with light from a source or sources away from the camera axis.

The backdrop and the scene may also, however, be illuminated with light of the same colour as the backdrop from a source close to the camera axis. In other words, the technique of the patents aforementioned does not have to be totally abandoned, rather, it is unnecessary, but can be used to sharpen up the image, the important thing being that a chroma-keying signal can be produced without the use of a light source on the camera axis and without the use of high intensity, off-axis lighting.

The backdrop colour may be blue - the conventional chroma-keying (old technology) colour, or it may be green, green having the advantage that it will readily separate from the background people, e.g. in a news interview, who tend to wear more blue than green.

As is made clear in the patents aforementioned, however, any colour can be used as a chroma-keying colour.

The use of retroreflective elements in the material appears to have the effect of intensifying the backdrop colour as seen by the camera, perhaps because they direct light from such illumination sources as are located off the camera axis back towards the sources themselves, leaving only light scattered from the backdrop colourant to reach the camera lens. In any event, with coloured and retroreflective backdrop material, no on-axis light is needed, and very much lower intensities of off-axis lighting are required than would be the case with non-retroreflective material.

The invention also comprises a backdrop material for chroma-keying comprising a coloured material with retroreflective elements, the material having a smooth surface.

The material may be a flexible sheet material such as a textile fabric.

The retroreflective elements may be hemispherically metallised microbeads, as in the patents aforementioned. In those patents, the surface of the backdrop material was required to be rough, so as to present more of the microbeads to light incident obliquely on the material, so as to give a more even apparent illumination to the backdrop over large areas, for effective chroma-keying. The material of the present invention does not need to be especially rough, as it is not required to retroreflect back to the camera.